

## **Motorcycle Loader for Pickup Trucks**

### **BACKGROUND**

The present invention relates to mounting, installing, attaching a motorcycle loading device to the bed of a pickup truck.

Conventional loading systems that are incorporated into the tailgate structure of a pickup truck for the purposes of providing a loading ramp into the bed of a pickup generally fall into two categories: telescoping planar plates or folding hinged plates to form an extensible surface.

Certain of the previously mentioned systems contain a number of disadvantages. In particular, the telescoping design is complicated to install or remove on the pickup truck. Additionally, certain telescoping designs are structurally inadequate for heavy loads such as a motorcycle. Further, the telescoping ramp does not make provision for controlled lowering of the ramp to the pickup truck bed as the load passes over the pivot point of the telescoping ramp.

The folding hinged plate design is complicated in its manufacture, difficult to install, difficult to deploy, reduces the amount of available cargo space in the pickup truck bed, and produces a sharp angular juncture point at the connection point of the ramp to the truck bed with the attendant possibility of high centering the motorcycle being loaded in the pickup truck bed.

To address the problems and shortcomings relating to conventional ramp systems, a motorcycle loading system that is simple in design, has few parts, can be installed and removed without tools, extends the length of the pickup bed, and has a controlled rate gas spring damper to modulate the rate of descent of the ramp as the load passes over the center point would be advantageous. The present invention addresses these needs.

## **Motorcycle Loader for Pickup Trucks**

### **Brief Description of the Drawings**

The summary and other objects, advantages, and features of the invention will become apparent from consideration and review of the claims and the description of the drawings in which:

**FIG. 1** depicts a fragmented perspective view of a pickup truck with the tailgate and ramp assembly installed in the retracted position and constructed in accordance with the principles of the subject invention.

**FIG. 2.** depicts a perspective view of the ramps proper in the retracted position.

**FIG. 3.** depicts a perspective view of the ramps proper in the extended position.

**FIG. 4.** depicts a perspective view of the top ramp segment.

**FIG. 5** depicts a perspective view of the bottom ramp segment.

**FIG. 6.** depicts a perspective view of the connector lug between the ramp proper and the damping linkage.

**FIG. 7.** depicts a fragmented rear elevation view of the ramp support frame and damping linkage.

**FIG. 8.** depicts a plan view of the tailgate replacement / ramp support structure.

**FIG. 9** depicts the connector plate to the pickup bed tailgate mounting hardware.

**FIG. 10** depicts the connector bar from the connector plate to the ramp support structure.

## **Motorcycle Loader for Pickup Trucks**

### **Detailed Description of the Drawings**

**Figure 1** shows a motorcycle loader ramp, ramp support structure, damper, and mounting hardware at the rear open end of the bed of a pickup truck. In this view the motorcycle loader is in the retracted position and the assembly is parallel with the bed of the pickup truck. The pickup truck (1) is a perspective-fragmented view including vertical sidewalls (32) and a bottom bed of the truck (5), the ramp (17 & 20) and ramp support structure (12.), a gas spring damper (30), damper reaction arm (29), and assembly hardware (28). The ramp support structure (12) mounts to the pickup truck bed using the same pivot points and hardware as the conventional tailgate. The support structure is designed to allow said frame structure (12) to move forward as load is applied, thus transferring load from the frame (12) to the truck bed (5) along support frame member (12). The ramp support frame (12.) is further supported and load transferred to the vertical sidewalls of the pickup truck (32) through a connection plate (13) and connection strap (16). The connection plate (13) has keyhole type slots to allow assembly, without the use of tools, to the pickup bed vertical walls and hardware (2 & 3) as furnished by the pickup truck manufacturer.

**Figure 2** The ramp is depicted in the closed position and is comprised of two channel sections (17 & 20) constructed so as to allow the inner ramp section (20) telescope rearward. In the retracted position as shown, the inner ramp is held secure by a spring loaded latch (25). The outer ramp (17) and inner ramp (20) are individually formed using a single sheet of aluminum tread plate or similar material, each ramp segment having six each ninety degree bends which imparts structural rigidity and acts as a guide for the telescoping action on the inner ramp (20). Moreover, the length of the sides of the outer ramp (17) are such so as to contact the pickup

truck bed, thus sharing the load with the pickup truck bed .Internal stops (21 & 22) are provided to limit the extent of travel of the inner ramp segment (20). A top ramp (17) mounting block and pivot hardware (18 & 19) is shown and provides a point of attachment.

**Figure 3** depicts said ramp in the extended position and shows the proximity of the travel limiting stops (21 & 22).

**Figure 4** depicts individually the outer ramp (17) with the attachment hardware (18, 19, & 22).

**Figure 5** depicts the inner ramp (20) the travel limiting stops (21) and the handles (23).

**Figure 6** depicts the attachment hardware base and pivot point (18) and the hexagonal block (19) to which attaches the damper reaction tube.

**Figure 7** depicts a fragmented centerline symmetrical view of the structural support (12), the outer ramp (17), the inner ramp (20), the ramp attachment hardware (18 & 28 ), the travel limiting stops (21 & 22), the damper reaction tubes (26, 27, & 29), and the relationship of one to another. The motorcycle loader structural support (12) supports, through the use of brackets (9) a mounting tube (26) through which the damper reaction tube (27 & 29) is inserted and connected to the outer ramp (17) with a threaded hardware hand wheel (28). Further, mounting tube (26) acts as a cam and as a load is applied to the ramp (17 & 20) when in the extended position, the two ramp segments lock together presenting a uniform plane without a change in angle at the juncture point. With the load removed from the inner ramp segment (20) said segment is free to be retracted.. Additionally as the load moves up the inclined ramp and moves forward past the attachment point (18) the load is transferred into the damper reaction tubes ((27 & 29), and further transmitted into the gas spring

damper (30) (fig. 1) and thence into the structural support (12). This results in the ramp (17 & 20) rotating in a controlled fashion about the pivot hardware (18 & 19) as it moves from an inclined position to that which is horizontal and parallel with the pickup truck bed.

**Figure 8** depicts a rectangular frame (12) with mounting hardware (8) brackets (9) and a mounting tube.

(26). The gas spring damper (30) is attached to the structural frame by utilization of brackets (7).

**Figure 9** depicts the connector plate (13) which is designed to be placed over the pickup truck conventional tailgate mounting hardware. Said plate is locked in place by the use of keyhole slots (14 & 15).

**Figure 10** depicts a connector bar (16) which assists in load sharing from the structural support (fig. 8.) to the side off the pickup bed (32) (fig. 1.)